

THAT WHICH IS CLAIMED:

Spa1

1. An isolated nucleic acid comprising a polynucleotide selected from the group consisting of:
- 5 a) a polynucleotide that encodes a polypeptide of SEQ ID NOS: 2, 4, 6, 8, 10, 14, 16, 18, 20, 22, or 24;
- b) a polynucleotide amplified from a *Zea mays* nucleic library using the primers made from SEQ ID NOS: 1, 3, 5, 7, 9, 13, 15, 17, 19, 21, or 23;
- 10 c) a polynucleotide comprising at least 25 contiguous bases of SEQ ID NOS: 1, 3, 5, 7, 9, 13, 15, 17, 19, 21, or 23;
- d) a polynucleotide encoding a maize AFP1 protein;
- e) a polynucleotide having at least 80% sequence identity to SEQ ID NOS: 1, 3, 5, 7, 9, 13, 15, 17, 19, 21, or 23;
- 15 f) a polynucleotide comprising at least 25 nucleotides in length which hybridizes under low stringency conditions to a polynucleotide having the sequence set forth in SEQ ID NOS: 1, 3, 5, 7, 9, 13, 15, 17, 19, 21, or 23;
- g) a polynucleotide comprising the sequence set forth in SEQ ID NOS: 1, 3, 5, 7, 9, 13, 15, 17, 19, 21, or 23; and
- 20 h) a polynucleotide complementary to a polynucleotide of (a) through (g).
2. A vector comprising at least one nucleic acid of claim 1.
3. A recombinant expression cassette, comprising a nucleic acid of claim 1
- 25 operably linked to a promoter, wherein the nucleic acid is in sense or antisense orientation.
4. A host cell comprising the recombinant expression cassette of claim 3.
- 30 5. A transgenic plant cell comprising the recombinant expression cassette of claim 3.

6. A transgenic plant comprising the recombinant expression cassette of claim 3.

5 7. The transgenic plant of claim 6, wherein the plant is selected from the group consisting of: maize, soybean, sunflower, sorghum, canola, wheat, alfalfa, cotton, rice, barley, and millet.

8. A transgenic seed from the transgenic plant of claim 7.

10

9. An isolated protein comprising a polynucleotide selected from the group consisting of:

a) a polypeptide comprising at least 25 contiguous amino acids of SEQ ID NO: 2, 4, 6, 8, 10, 14, 16, 18, 20, 22, or 24;

15

b) a polypeptide which is a maize AFP1 protein;

c) a polypeptide comprising at least 75% sequence identity to SEQ ID NO: 2, 4, 6, 8, 10, 14, 16, 18, 20, 22, or 24;

d) a polypeptide encoded by a nucleic acid of claim 1; and

20

e) a polypeptide characterized by SEQ ID NO: 2, 4, 6, 8, 10, 14, 16, 18, 20, 22, or 24.

10. A method of modulating the level of an AFP1 protein in a plant, comprising:

25 a) introducing into a plant cell with a recombinant expression cassette comprising an AFP1 polynucleotide of claim 1 operably linked to a promoter;

b) culturing the plant cell under plant growing conditions to produce a regenerated plant; and

c) inducing expression of said polynucleotide for a time sufficient to modulate the AFP1 protein in said plant.

30

11. The method of claim 10, wherein the plant is selected from the group consisting of: maize, soybean, sunflower, sorghum, canola, wheat, alfalfa, cotton, rice, barley, and millet.

5 12. The method of claim 10, wherein the level of AFP1 protein is increased.

2022-05-06 10:00:00